



Department of Pesticide Regulation



Mary-Ann Warmerdam
Director

MEMORANDUM

Arnold Schwarzenegger
Governor

TO: Barry Cortez, Chief
Registration Branch

FROM: John S. Sanders, Ph.D., Chief
Environmental Monitoring Branch
(916) 324-4100

DATE: December 20, 2004

SUBJECT: RECOMMENDATION FOR INITIATING A REEVALUATION AND A NEW
REGISTRATION REQUIREMENT FOR VOLATILE ORGANIC COMPOUND
EMISSION POTENTIAL DATA

Overview of Recommendations

The Environmental Monitoring Branch (EM) recommends that the Registration Branch initiate a reevaluation of certain liquid and other pesticide formulations to mandate the submission of volatile organic compound (VOC) emission potential data. EM also recommends that the submission of VOC emission potential data be required as a condition of registration.

The basis for the reevaluation and registration requirement is concern about the release of VOCs from pesticide product formulations into the atmosphere. The photochemical interaction of VOCs and oxides of nitrogen results in the formation of ground-level ozone. Ozone is harmful to vegetation, and causes respiratory irritation and illnesses in humans. Ozone can irritate the mucus membranes of the mouth, nose, and throat; increase breathing difficulties, damage lungs, and worsen existing respiratory problems, such as asthma. Many pesticide active ingredients and inert ingredients are VOCs and have been detected in air. The California Air Resources Board (ARB) estimates that pesticides are the sixth highest source of VOC emissions in the San Joaquin Valley, accounting for approximately six percent of all VOC emissions in that region. While the amount of ozone created by most pesticide active ingredients has not been measured, the chemical structures of pesticides indicate many will create ozone. Some pesticide active ingredients such as acrolein, and inert ingredients such as xylene are known to have a high ability to create ozone.

The federal Clean Air Act requires states to submit state implementation plans (SIP) for implementing, maintaining, and enforcing national ambient air quality standards (NAAQS) for air pollutants, such as ozone, in each air quality control region of the State. Any region that does not meet the NAAQS for a given pollutant is designated as a federal nonattainment area (NAA). Currently, several California air quality control regions do not meet the NAAQS for ozone.



In 1994, ARB submitted an SIP to the U.S. Environmental Protection Agency. The SIP included a pesticide element. The pesticide element (also referred to as the Pesticide SIP) addresses VOCs that result from the use of agricultural and commercial structural-use pesticides. Consumer pesticide product sources of VOCs are regulated by ARB. In the pesticide element, the Department of Pesticide Regulation (DPR) committed to reducing VOC emissions from agricultural and commercial structural-use pesticides by specified amounts within specified time periods for five NAAs. Currently, three of the five NAAs do not meet the goals established in the 1994 SIP: San Joaquin Valley, Southeast Desert, and Ventura.

To implement the 1994 SIP, DPR developed a method to estimate the VOC content (emission potential) of pesticide products and to calculate estimated pesticidal VOC emissions. DPR used thermogravimetric analysis (TGA) data to determine the VOC content of each pesticide product, and in conjunction with data from DPR's pesticide use-reporting system calculated estimated annual VOC emission totals for each pesticide product. In order to obtain TGA data on each agricultural and commercial structural-use pesticide, DPR placed all agricultural and commercial structural-use pesticides formulated as liquids into reevaluation in 1994 and all solid formulations into reevaluation in 1995.

However, during these reevaluations, DPR gave registrants the option of calculating the VOC emission potential of a pesticide product using water and/or inorganic subtraction, instead of submitting TGA data. In addition, if no data (either TGA or subtraction) were submitted for a given pesticide product, DPR assigned the product a default emission potential value based on the median TGA value for the product's formulation category. In 1996, DPR requested that registrants of new agricultural and commercial structural-use products submit TGA data for each new product. A few registrants of new pesticide products submitted TGA data; however, the majority did not, and DPR had to assign default emission potential values to many new pesticide products.

As a result, DPR only has TGA data for approximately 30-40 percent of currently registered agricultural and commercial structural-use pesticides. This means that DPR's current calculations of total VOC emissions from pesticide products may be inaccurate. DPR needs actual TGA emission potential data for each currently registered agricultural and commercial structural-use pesticide product. Since pesticide products formulated as liquids have the highest VOC emission potential and constitute the bulk of the products with unknown (default) emission potentials, EM recommends placing these products into reevaluation and requiring the submission of TGA data on each product. EM also recommends requiring the same emission potential data for certain new pesticide products. This data is necessary to reduce the uncertainty in DPR's emission inventory, and allow DPR to more accurately determine reductions in total VOC emissions from pesticide products.

Specific Recommendations

EM recommends placing 852 pesticide products into reevaluation (Attachment 1). These products meet all of the following criteria:

- 1) Are formulated as liquids (i.e., emulsifiable concentrate, aqueous concentrate, flowable concentrate)
- 2) Have active registrations as of 8/30/2004
- 3) Are registered for use on at least one of the site codes DPR includes in the VOC inventory;
- 4) Have a "registration number" (consisting of Manufacturer/Company Firm Number-Product Label Sequence Number) that is identical to that of a product that was applied in the 2002 statewide pesticide use report in an amount greater than ten pounds. This includes products with the same "registration number" that are related by being either additional brand names or distributor registrations (subregistrations). The formulations of additional brand names and distributor registrations are assumed not to differ in any substantive way
- 5) Do not have a registration number that is the same as any product that has either a "derived" emission potential or a TGA-based emission potential;
- 6) Are not spray adjuvants
- 7) Do not contain the following as a primary active ingredient (DPR has accurate estimates of TGA values for these products containing these active ingredients):
 - a. 1,3-dichloropropene
 - b. chloropicrin
 - c. metam-sodium
 - d. methyl bromide
 - e. metam potassium
 - f. sodium chlorate
 - g. sodium hypochlorite

All products meeting the above criteria should provide emission potential data using the TGA method described in Attachment 2, or other method acceptable to DPR. Attachment 2 is a simplified and more streamlined version of the method used for the 1994 reevaluation. The 1994 DPR method would also be acceptable for this reevaluation. Other methods that give comparable or a more accurate estimate of the emission potential would also be acceptable. However, the method must first be approved by DPR. DPR should consider limited exemptions from the TGA data requirement, such as chemical properties that make it physically impossible to conduct the TGA test. "Water subtraction" or other methods should not be allowed unless they provide a more accurate estimate of the emission potential than TGA.

An accurate statement of formula should also be required for each product included in the reevaluation. In order to obtain an accurate estimate of a product's VOC emission potential, the results of the TGA method must be corrected for the water content of the pesticide product and the percentage of any exempt compounds. Attachment 3 contains a list of exempt compounds. The VOC emission potential of a pesticide product will be corrected for the water content or any exempt chemical present in any trade name inert ingredient in the primary product if, we receive a statement of formula for the trade name inert.

Test results and other information should be submitted using the form in Attachment 4. A separate form, along with the data and information listed on the form, should be submitted for each product being reevaluated.

The registrant may choose the laboratory to conduct the TGA method. A list of laboratories that have expressed an interest in conducting TGA studies is attached for informational purposes (Attachment 5). DPR should not recommend or endorse any of these laboratories.

EM also recommends requiring VOC emission potential data for each new pesticide product that meets all of the following criteria:

- 1) Formulated as a liquid (i.e., emulsifiable concentrate, aqueous concentrate, flowable concentrate)
- 2) Intended for use on at least one of the use sites included in DPR's VOC inventory
- 3) The product's registration number is different from other pesticide products with either a "derived" emission potential or a TGA-based emission potential
- 4) Not a spray adjuvant
- 5) Does not contain the following chemicals as a primary active ingredient:
 - a. 1,3-dichloropropene
 - b. chloropicrin
 - c. metam-sodium
 - d. methyl bromide
 - e. metam potassium
 - f. sodium chlorate
 - g. sodium hypochlorite

Barry Cortez
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Please contact Randy Segawa, of my staff, if you have any questions regarding this reevaluation recommendation.

Attachments

cc: Paul Gosselin, DPR Chief Deputy Director (w/Attachments)
Polly Frenkel, DPR Chief Counsel (w/Attachments)
Douglas Y. Okumura, DPR Assistant Director (w/Attachments)
Randy Segawa, DPR Senior Environmental Research Scientist (w/Attachments)
Ann Prichard, DPR Senior Environmental Research Scientist (w/Attachments)

bcc: Segawa Surname File (w/o Attachments)